

Adult Attention–Deficit/Hyperactivity Disorder in Medical Residents in the University Hospital

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Abstract:

Objective: Attention–deficit/hyperactivity disorder (ADHD) is common during childhood and can persist into adulthood. Adult ADHD is often under–recognized, which can lead to an increased risk of functional impairment and comorbidity. This study investigated the prevalence of adult ADHD in medical residents and the association between adult ADHD and functional impairment.

Material and Methods: This cross–sectional study focused on medical residents recruited from each department of Srinagarind Hospital from July 2023 to July 2024. Tools including the ADHD self–reporting scale (ASRS–v.1.1) screener Thai version, which consists of 6 items, and the Weiss functional impairment rating scale (WFIRS) Thai version were used for screening adult ADHD symptoms and for assessing functional impairment in 7 domains: family, work, school, life skills, self–concept, social, and risk.

Results: Overall, 103 medical residents were recruited (mean age 27.4 years; 50.5% female). Based on the cutoffs of the scales, 22.3% of the medical residents were likely to have adult ADHD symptoms. The most prevalent impairment in adult ADHD was in life skills, and the highest impairment score was in self–concept. The study found that medical residents with ADHD experienced functional impairment in work, school, life skills, self–concept, and risk. These findings indicated significant statistical differences when compared to those without ADHD.

Conclusion: The prevalence of adult ADHD among medical residents in this study was 22.3%. Adult ADHD impacts multiple aspects of life. Thus, early treatment of adult ADHD in medical residents will also reduce consequent risks.

Keywords: adult ADHD, functional impairment, medical resident

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Introduction

Attention-Deficit/Hyperactivity Disorder (ADHD) is a common neurodevelopmental disorder that typically begins in childhood and may persist into adulthood¹. Inattention, hyperactivity, and impulsivity are the core symptom domains of the disorder. Approximately 45.7% of individuals diagnosed with ADHD in childhood continue to exhibit symptoms in adulthood².

ADHD significantly affects multiple areas of functioning, including academic performance, occupational, social interactions, interpersonal relationships, and self-esteem. It is also associated with an increased risk of psychiatric comorbidities such as depression, anxiety, and substance use disorders^{3,4}. However, adult ADHD remains underdiagnosed and undertreated⁵.

Generally, ADHD is diagnosed through clinical interviews using the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5). However, DSM-5 criteria were originally developed for children and adolescents, and some items—such as hyperactivity symptoms are not fully appropriate for adults¹. This limitation has led many specialists to develop screening tools and diagnostic instruments for adult populations, for example, the Adult ADHD Self-Report Scale (ASRS) v1.1 checklist, which consists of 18 items (sensitivity 56.3%, specificity 98.3%), and the ASRS v1.1 screener, which consists of 6 items (sensitivity 68.7%, specificity 99.5%)⁶. The ASRS v1.1 screener was translated and validated in Thai, demonstrating a sensitivity of 93.94% and a specificity of 71.64%¹.

Previous studies have reported that the prevalence of adult ADHD among medical students ranges from 8.4% to 24.4%⁷⁻¹¹ using the ASRS v1.1 screener in different languages. It is one of the most impactful psychiatric disorders in this population. At the same time, Adult ADHD has significant impacts on academic performance, work performance, and daily functioning.

ADHD-related Functional impairment was assessed using the Weiss Functional Impairment Rating Scale (WFIRS), which is considered a comprehensive instrument for evaluating functional impairment in individuals with ADHD¹². The questionnaire consists of 7 domains related to family, school, work, life skills, self-concept, social activities, and risky activities.

However, data on the prevalence of adult ADHD and its associated functional impairments among medical students remains limited, and data are even more scarce among medical residents in Thailand. As medical residents are future medical professionals, their heavier workloads and greater responsibilities may place them at a higher risk of functional impairment, which may also affect the quality of care provided to patients.

Therefore, this study investigated the prevalence of adult ADHD and associated functional impairments among medical residents, aiming to raise awareness about the disorder. Furthermore, early detection and intervention help to improve long-term outcomes⁴. It may lower the risk of complications and comorbid psychiatric conditions.

Material and Methods

The present study was conducted at a tertiary care university hospital in Northeast Thailand. The study protocol was reviewed and approved by the Khon Kaen University Ethics Committee for Human Research (Approval No. KKU 660301.6.2.3/932/66; dated October 2, 2023), in accordance with the Declaration of Helsinki and the ICH Good Clinical Practice Guidelines.

Based on previous studies, the prevalence of ADHD among medical students in China, a population comparable to Thailand, was reported to be 8.4%¹¹. Using this prevalence estimate and a total population of 572 medical residents in the present study, the required sample size was calculated to be 98 participants. After accounting for a 20% dropout rate, a total of 118 participants were targeted for recruitment.

A total of 118 participants, consisting of medical residents from all departments, were recruited. Eligible participants were those who were willing to participate and had provided informed consent. Participants enrolled in other studies were excluded to reduce participant burden and to minimize potential confounding effects. Randomization was performed using stratified random sampling to allocate residents into 4 groups, ensuring equal chances for participants from minority departments. Data were collected with the assistance of administrative assistants from each department, who helped explain the study information to participants. Participants were randomly selected by an administrative assistant or participated voluntarily, without consideration of gender or year of training. The sample size in each department was proportionally allocated according to the number of medical residents in each department. Informed consent was obtained from all the participants prior to data collection. Data were collected at the department conference room on a single occasion using 2 self-reported questionnaires on paper: The Adult ADHD Self-Report Scale (ASRS) Screener V1.1 and the Weiss Functional Impairment Rating Scale-Self Report (WFIRS-S).

Demographic data were collected. The Adult ADHD ASRS Screener V1.1, Thai version, a 6-item, self-reported questionnaire assessing the frequency of behaviors in the past 6 months (never, rarely, occasionally, often, very often), was used to screen for ADHD symptoms (sensitivity 93.94%, specificity 71.64%)¹. If 4 or more items were positive, then the screening result was considered positive for adult ADHD. Meanwhile, the WFIRS-S, Thai version, was also administered to assess functional impairment. This instrument consists of 69 items across seven domains: family, work, school, life skills, self-concept, social, and risk¹³. It assesses behaviors over the past month using a 0–3 rating scale (0=never, 1=sometimes, 2=often, 3=very often). Functional impairment is identified when: (1) there

are at least two items scored 2 or scored 3, at least one item within a domain, or (2) the mean score of each domain exceeds 1.5.

Data analysis was performed using Statistical Package for the Social Sciences (SPSS) version 26.0 (IBM Corp., Armonk, NY, USA). Quantitative variables were summarized using means, standard deviations, and percentiles, while qualitative variables were presented as frequencies and percentages. The association between ADHD symptoms and functional impairment was examined using chi-square tests, with p -value<0.05 considered statistically significant.

Results

Data were collected from July 2023 to July 2024. A total of 118 participants were recruited for the study. Of the 118 participants initially screened, 15 were excluded due to incomplete data. The result was a total of 103 participants in this study. The number of female participants ($n=52$) was comparable to males ($n=51$).

Table 1 describes the sociodemographic characteristics of the participants. The mean age was 27.4 years, and the gender distribution was comparable. Most participants were single ($n=98$, 95.1%). The majority were 1st year residents, in total 48 participants (46.6%). The largest proportion of participants was from the Department of Internal Medicine (20.4%). The results indicated that 23 participants (22.3%) screened positive for adult ADHD. Among this group, 15 participants (65.2%) were female.

From the ASRS screener, participants most frequently responded 'rarely' to the 6 screening questions. Significant differences were observed between the ADHD-positive group and the non-ADHD group in item-1 ('How often do you have trouble wrapping up the final details of a project once the challenging parts have been done?'; p -value<0.001) and item-2 ('How often do you have

difficulty getting things in order when you have to do a task that requires organization?’). However, no significant gender differences were found.

Table 2: A total of 63 participants (61.2%) had functional impairment in at least 1 domain. The majority were female (n=33, 52.4%). Among those with functional impairment, the most affected domain was life skills (n=58, 56.3%), followed by the risk domain (n=22, 21.4%), although less frequently occurring, which reflects significant life impact and is associated with serious consequences. The least affected domain was the family domain (n=3, 2.9%).

Table 1 Sociodemographic characteristics of the participants

Variables	n (%)
Age (years), $\pm$ S.D.	27.4 $\pm$ 1.93
Gender	
Male	51 (49.5)
Female	52 (50.5)
Departments	
Pediatrics	7 (6.8)
Ophthalmology	5 (4.9)
Psychiatry	5 (4.9)
Forensic Medicine	1 (1.0)
Radiology	9 (8.7)
Anesthesiology	9 (8.7)
Family Medicine	5 (4.9)
Emergency Medicine	3 (2.9)
Rehabilitation	3 (2.9)
Surgery	15 (14.6)
Obstetrics and Gynecology	5 (4.9)
Otorhinolaryngology	5 (4.9)
Orthopedics	7 (6.8)
Occupational Medicine	3 (2.9)
Internal Medicine	21 (20.4)
Years	
1 st year	48 (46.6)
2 nd year	22 (21.4)
3 rd year	21 (20.4)
4 th year	11 (10.7)
5 th year	1 (1.0)
Status	
Single	98 (95.1)
Married	4 (3.9)
Divorced	1 (1)
Underlying disease	
Yes	89 (86.4)
No	14 (13.6)

Table 1 (continued)

Variables	n (%)
Family history of ADHD	
Yes	1 (1.0)
No	102 (99.0)
Alcohol drinking (standard unit/week)	
0	82 (79.6)
1	14 (13.6)
2	4 (3.9)
3	1 (1.0)
4	1 (1.0)
5	1 (1.0)
Smoking (cigarettes/week)	
0	102 (99.0)
10	1 (1.0)
Social media use (hours/day)	
<1	22 (21.8)
1	11 (10.9)
2	14 (13.9)
3	19 (18.8)
4	14 (13.9)
5	8 (7.9)
6	6 (5.9)
7	1 (1.0)
10	3 (3.0)
12	3 (3.0)

ADHD=attention-deficit/hyperactivity disorder, S.D.=standard deviation

Table 2 The prevalence of functional impairment across domains among the participants

Functional impairment	N (%)
Family	3 (2.9)
Work	13 (12.6)
School	17 (16.5)
Life skills	58 (56.3)
Self-concept	16 (15.7)
Social	9 (8.8)
Risk	22 (21.4)

Table 3 demonstrates the association between the ADHD and non-ADHD groups with functional impairment. Among participants in the ADHD group, there was a statistically significant association with functional impairment (p-value<0.001). Functional impairment in at least one

domain was found in 21 participants with ADHD (91.3%), compared with 42 participants without ADHD (52.5%). Statistically significant differences were observed in the domains of work (p -value=0.001), school (p -value=0.021), life skills (p -value=0.001), self-concept (p -value<0.001), and risk (p -value<0.001).

Table 4 compares the mean functional impairment scores across domains between participants with ADHD and the non-ADHD group. The ADHD group showed consistently higher mean scores of functional impairments across all domains compared with the non-ADHD group. Statistically significant differences were observed in the domains of family (p -value=0.005), work (p -value=0.017),

life skills (p -value=0.026), self-concept (p -value<0.001), social (p -value=0.011), and risk (p -value<0.001).

In this study, we also examined factors that might influence or be associated with ADHD. We found no significant association in the case of family history of ADHD (p -value=0.22), drinking alcohol (p -value=0.24), and social media use (p -value=0.39).

Discussion

The present study aimed to determine the prevalence of adult ADHD among medical residents and to examine the association between ADHD symptoms and functional impairment. Our findings revealed that 22.3% of medical

Table 3 The association between the ADHD and non-ADHD groups with functional impairment

Functional impairment	ADHD (N=23), n (%)	Non-ADHD (N=80), n (%)	p-value
Family	1 (4.3)	2 (2.5)	0.54
Work	8 (34.8)	5 (6.3)	0.001**
School	8 (34.8)	9 (11.3)	0.021*
Life skills	20 (87.0)	38 (47.5)	0.001**
Self-concept	10 (43.5)	6 (7.6)	<0.001**
Social	3 (13.0)	6 (7.6)	0.418
Risk	12 (52.2)	10 (12.5)	<0.001**

*Correlation is significant at the 0.05 level **Correlation is significant at the 0.01 level
ADHD=attention-deficit/hyperactivity disorder

Table 4 Mean functional impairment score between the ADHD and non-ADHD groups

Functional impairment	ADHD Mean (S.D.)	Non-ADHD Mean (S.D.)	p-value
Family	0.53 (0.34)	0.30 (0.3)	0.005**
Work	0.72 (0.42)	0.40 (0.33)	0.017*
School	0.67 (0.36)	0.38 (0.36)	0.059
Life skills	1.08 (0.55)	0.62 (0.45)	0.026*
Self-concept	1.24 (0.68)	0.54 (0.57)	<0.001**
Social	0.59 (0.45)	0.32 (0.41)	0.011*
Risk	0.47 (0.34)	0.19 (0.24)	<0.001**

*Correlation is significant at the 0.05 level **Correlation is significant at the 0.01 level
ADHD=attention-deficit/hyperactivity disorder, S.D.=standard deviation

residents screened positive for adult ADHD. This prevalence is consistent with previous studies, which reported rates of approximately 23.7%^{7-8,15}. In contrast, a study conducted in China found a lower prevalence of 8.4%¹¹. The discrepancy may be attributable to differences in the psychometric properties of the screening tools across languages. The Chinese version of the ASRS demonstrated lower sensitivity (78% vs. 93.94%) but higher specificity (85% vs. 71.64%) compared with the Thai version, which could result in a lower reported prevalence.

Additionally, we found that a higher proportion of participants who screened positive for ADHD were female (65.2%), which contrasts with most previous studies. This discrepancy may be explained by potential confounding factors such as depression and anxiety symptoms, which often overlap with ADHD symptoms. Previous studies have also shown that depression and anxiety are more frequently found in females than in males¹⁶⁻¹⁷. Such overlap may have contributed to the higher prevalence observed among females in this study.

Multiple previous studies have shown that inattentive symptoms often persist from childhood into adulthood, whereas hyperactivity/impulsivity tends to decline with age. Several researchers have also observed that certain types of functional impairment may drive individuals to seek treatment more than the presence of the ADHD symptoms themselves. Nonetheless, interest in functional impairment may also reflect underlying ADHD symptoms. Furthermore, adults with ADHD have been found to experience significant social impairments, including difficulties in both romantic and peer relationships. They tend to exhibit relationship maladjustment and poorer social skills, which may contribute to greater feelings of loneliness compared with individuals without ADHD¹⁸⁻¹⁹. They also experience difficulties in school and educational achievement, often demonstrating low motivation, less organization, and reduced self-control behavior²⁰. Adults with ADHD also have work problems. They have been reported to have lower job stability,

impulsively quitting jobs or being fired by employers²¹. In the family domain, adults with ADHD have been shown to exhibit poorer self-control, frequent emotional outbursts, and more inconsistent discipline compared with non-ADHD adults²¹. The self-concept domain reflects self-perception and sense of capacities. Adults with ADHD often experience problems with attention to detail, forgetfulness (e.g., missed appointments), and failure to complete tasks, which may contribute to lower self-esteem²¹. The life skills domain assesses adaptive skills necessary for independent daily living. Adults with ADHD have been shown to be less organized with poor time management, which may result in inattentive symptoms¹⁹. Although impairments in the risk domain may be reported less frequently, they remain clinically significant, as they can be associated with serious consequences, for example, legal violations and engagement in risky sexual behaviors, such as inconsistent condom use¹⁴.

Therefore, in this study, we found statistically significant associations between ADHD symptoms and functional impairment across multiple domains, including work, school, life skills, self-concept, and risk, when compared with the non-ADHD group. Functional impairment in life skills was particularly frequent in the ADHD group.

Furthermore, participants in the ADHD group demonstrated the greatest impairment in the self-concept domain (mean score=1.24), which was significantly higher than in the non-ADHD group. This finding is consistent with the results of previous studies^{12,22}. Self-concept impairment may result from persistent inattentive symptoms or from the influence of comorbid conditions, such as depression and anxiety, leading to negative self-perceptions, low self-worth, and feelings of inadequacy.

In addition, the risk domain had the lowest impairment scores in both the ADHD and non-ADHD groups, consistent with previous studies. Although lower scores may suggest less frequent risk-taking behaviors, the presence of such behaviors can still carry substantial

consequences, such as legal violations, underscoring their clinical significance despite the lower frequency.

This study is the first to investigate the prevalence of adult ADHD among medical residents in Thailand, examining both the prevalence and its impact on functional impairment across 7 domains. The findings may raise awareness of the potentially higher prevalence of adult ADHD compared with previous studies, as well as the impacts that may be greater than previously anticipated, which may contribute to greater awareness and promote earlier intervention.

A potential bias in this study is selection bias, as participation was voluntary despite the use of stratified random sampling to distribute participants across specialties according to their population proportions, which was intended to reduce bias. Volunteer participants in this population may be more likely to recognize abnormal or ADHD-related symptoms, such as inattention, because these symptoms can have a greater impact on their work and therefore become more noticeable to themselves. Medical residents who experience greater functional difficulties may have been more motivated to participate in this study, leading to an over-representation of individuals with a higher symptom burden. This is consistent with evidence that functional impairments strongly predict mental health help-seeking, and with reports of an 'unhealthy volunteer effect' in mental health research²³. This may have resulted in a higher prevalence of ADHD in this study compared with the general population.

Another factor that may have influenced results is the presence of confounding factors, such as depression or anxiety disorders. Symptoms of these conditions may overlap with ADHD symptoms on the screening tools, potentially leading to an overestimation of the prevalence of ADHD compared with diagnoses based on clinical interviews. Another limitation of the study is that depression and anxiety were not evaluated. Given that depression and

anxiety symptoms can adversely affect concentration and disrupt daily functioning, they may contribute to functional impairment regardless of ADHD symptoms.

Future research should aim to further develop and refine the screening instrument by applying it across multiple populations and comparing the results with diagnostic interviews conducted by specialists. This would help determine the accuracy of the screening tool and support its use in improving early detection, with greater accuracy through higher sensitivity and specificity, which may help facilitate earlier recognition and earlier intervention, while reducing any negative consequences.

Conclusion

We found a higher prevalence of adult ADHD among medical residents than previously reported, with a greater impact on functional outcomes than expected. These findings suggest the importance of early screening and greater clinical attention to ADHD symptoms in this population. Increasing awareness and early intervention may help reduce any negative life consequences and other comorbidities.

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Conflict of interest

The authors declare no conflicts of interest.

Ethical approval

The study protocol was approved by the Khon Kaen University Ethics Committee for Human Research (Approval No. KKU 660301.6.2.3/932/66; dated October 2, 2023).

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